

XI. *Notes on the Euchalcis vetusta, Dufour* (Fam. Chalcididæ); and on the terminal segments of the females in *Halticella* and its allies. By SIR SIDNEY SAUNDERS, C.M.G.

[PART I.—Read February 1st, 1882.]

PLATE XII.

In the recently published 3e trimestre of the 'Annales de la Société Entomologique de France,' 1881 (6e série, tome 1), M. Edmond André, in his "Notes Hyménoptérologiques" (p. 333), has revised the sectional divisions introduced into the genus *Chalcis* of Fabricius, which, for the reasons adverted to, he would restrict to three; namely, (1) *Chalcis* proper; (2) *Smicra*, Spinola; and (3) *Halticella*, Spinola. To this last he refers the genus *Euchalcis* of Dufour, who described four species from Spain in the aforesaid 'Annales' for 1861 (4e série, tome 1, p. 9; pl. 1, figs. 4—7, and figs. 8—10). The third species—his *E. vetusta*, taken by himself near Saragossa—is thus characterised:—" *Euchalcis vetusta*, Duf. Atræ, nitida, subtiliter punctata; capite subtriangulari; scutello convexo subrotundato acute bispinoso; metathorace utrinque bispinuloso, albo-sericeo punctato; tegula rufa; alis fumosis, basi punctoque in medio subcostali diaphanis; abdomine conico, acutissimo, subtrigono, levi, ferrugineo, apice nigro; pedibus nigris, tarsis fuscis; femoribus posticis subtus ad basin obtuse bidentatis. Long. 3 lin."

"Mense martio 1811 capiebam hanc speciem Zaragoza circa."

To this he appends the following remarks:—" Cette espèce d'*Euchalcis*, dont j'ai conservé une description suffisamment détaillée, n'est plus en mon pouvoir. Elle passa en 1815 dans la collection de Latreille, et de là je ne sais où. Elle a tous les caractères indiqués dans le signalement générique."

In our Transactions for 1873 (p. 414) I described the two sexes of an allied species, under the name of *Halticella osmicida*, found in Epirus, within the desiccated

blackened tegument of the adult larvæ of *Osmia tridentata*, and undergoing their metamorphoses therein, each occupying the interior of a single larva, having the head directed towards the broad anal segments of the latter, thus pointing downwards in the briar-cells, and issuing therefrom in the imago state about the middle of June. This differed from Dufour's species in having the *incrassated posterior femora bright red* in the female, and the *tegula black*; whereas in the corresponding sex of the latter all the legs were black, and the tegula red.

M. Jules Lichtenstein, of Montpellier, the following year obtained a female, which he supposed to be the lost *Euchalcis vetusta*, Duf., from briars in the South of France;—found “à l'intérieur d'une larve d'*Osmia* toute déséchée et d'un noir de jais brillant” (*Annales*, 1874; *Bulletin*, p. lxiv). He had not then been enabled to determine the species of *Osmia* referred to; but subsequently the same diligent observer reared both sexes of this *Halticella* from the briar-cells of *Osmia tridentata* (*Annales*, 1879; *Bulletin*, p. xliii); still referring thereto as the “*Euchalcis vetusta* que l'on n'avait pas signalé, en France du moins, depuis 1815.” He made no mention, however, on either occasion, of his specimens differing from Dufour's diagnosis, as aforesaid; while recognising them as identical with those of *H. osmicida*; adding, that my observations on their economy were “absolument analogues” to his own.

M. André now figures this French species, in default of any other, as the genuine representative and antitype of the long-lost Spanish original; admitting, however, that “la description de Dufour indique des *écailles rouges* et des *pattes noires*; l'insecte représenté possède au contraire des *écailles très noires* et des *cuissees rouges*!” He suggests the following explanation of this discrepancy. Speaking of the Spanish type, he says:—“C'est sans doute une variété curieuse, ou peut-être une erreur de copie du Dufour, qui, au moment de la publication de cette espèce, en 1861, ne l'avait plus sous les yeux depuis 1815, et ne pouvait se reporter qu'à des notes conservées depuis cette époque et peut-être incomplètes.”

It would seem somewhat gratuitous to treat the described Spanish prototype as a curious variety, and to substitute in its stead a French species essentially divergent therefrom; nor less so to suppose that, by

some possible clerical error, Dufour, habitually so precise, should have transcribed red for black, and black for red; nor can it be deemed more plausible that, while carefully recording in his notes the minutest details and specially adverting to the posterior femora, he should have omitted to define their most striking characteristic! Moreover, to sink the described species to an aberrant qualification would render its diagnosis abortive and illusory. Why, indeed, should not Dufour's *E. vetusta*, coinciding therewith, occur again on the banks of the Ebro? Has anyone, in France or elsewhere, reared such a so-called "variety" commingled with others corresponding with its ideal representative? Do we even know that the Spanish specimen was nurtured by the same species of bee? What then can be held to justify such a transfiguration; rather than regard Dufour's type—of different origin and unknown life-history, completing also its metamorphoses at an earlier period (March instead of June)—as essentially distinct from the species now inaugurated in its stead?

Let us listen, however, to Dufour's arguments in a strictly parallel case recorded in the same Mémoire of 1861, when, adverting to the *C. Dargelasi*, confounded by Latreille with the *C. rufipes*, Oliv., Dufour remarks:—"Quant à la couleur de ces grosses cuisses d'un rouge ferrugineux qui saute aux yeux, Olivier n'eût pas manqué de la signaler si elle avait existé dans son espèce, et il a gardé le silence" (*loc. cit.*, p. 10). We have only to read Dufour for Olivier, and the application is perfect. Can we then attribute such palpable inconsistency to the inspired writer of these words? Do they not convey—as it were by anticipation—his indignant protest against such an incredible oversight being imputed to him? What, indeed! Commit the same blunder himself on the one page, which he repudiates in Olivier on the next! His attention had been thus forcibly called to the very point now at issue, as regards the presence or the absence of those *conspicuous red femora* which, according to his own dictum, he could not have failed to indicate in his recorded notes had such existed; yet, like Olivier, *il a gardé le silence!*

But, irrespective of this, I would ask—By what criterion are we to be guided in works of reference, if not by the authoritative descriptions originally supplied for this purpose? Are we, as in this instance, to

supersede the text by exhibiting, as a standard of comparison, any figure which may be hypothetically ascribed to a lost type, though confessedly at variance with the authentic record? Are we, in such cases, in accordance with this new doctrine, liable to have primary definitions transmuted, *ad libitum*, to suit any other species of supposititious identity by fanciful illustrations of the one for the other? Yet such is the avowed object which our worthy colleague proposes to attain:—"C'est pour fixer définitivement cette espèce que j'ai cru utile d'en donner le dessin"!

In so novel a case some may be tempted to enquire how such fixity of tenure in the domain of science can be definitively conferred upon any interloper, in striking contrast to the immutable precepts of the original diagnosis—or how conjectural disquisitions of casual inference can serve to influence the development of such a theory? Moreover, how can Dufour's record be questioned in this instance, after his own comments as aforesaid? At all events his definition must be taken for what it is worth, and duly respected as a legitimate title which cannot be infringed; so that no such process as that now resorted to can avail to instal an incongruous substitute in the lapsed estate of the titular absentee!

By some inadvertence, however, M. André cites Dufour's species as *Halticella venusta* = *Euchalcis venusta* (p. 340), under which name he has also figured the French species (p. 344); while, by a curious coincidence, the *H. osmicida*, male and female, were figured by Mr. C. O. Waterhouse, in the course of last year, in his 'Aid for the Identification of Insects' (part v., plate 40). If, therefore, the French species be really identical with the latter, as alleged, the names respectively assigned thereto in these figures are obviously synonymous, without in any way detracting from the prior claims of Dufour's type, irreconcilable with either.

I have deemed it requisite to offer these remarks in self-justification for having characterised the *Halticella osmicida* as a new species in 1873; while I avail myself of this occasion to furnish a more detailed description of the antennæ and abdomen, with reference more especially to the terminal segments hereinafter adverted to.

NOTE.—In *Halticella osmicidæ* diagnose (*loc. cit.*, 1873) lege ut sequitur:—*Antennæ* utroque sexu 11-articulatæ, geniculatæ; scapo fere recto, in sulco faciei depresso, capitis longitudine; articulo 2do parvo, basi constricto, recurvo; 3tio minimo, transverso; 4to sensim latiore, sequentibus parum longiore; reliquis fere cœqualibus, subquadratis; extimo conico. *Abdomen* basi subtilissime punctatum; *maris* ovatum, nigrum, segmentis 7tem, extimo basi utrinque spiraculifero; *feminæ* elongato-conicum, segmentis (absque cauda ventrali) sex, quorum tribus vel quatuor basalibus lucentibus rufis, parce punctatis; reliquis cum cauda nigris; 6to (epipygio, Sichel) longiore, deflexo, crasse punctato, prope basin utrinque puncto spiraculiformi parvo rotundo oblique instructo. Cauda (Sichel) ab hypopygii apice terebram involvente composita, scabriuscula, superne utrinque spiraculifera; terebræ valvularum compressarum apice subtrigono, rugoso, subtus producto; terebra ipsa parum longiore. Segmentis dorsalibus valde deflexis, prominulis, ventralibus ab illis fere obtectis.

[PART II.—Read March 1st, 1882.]

IN referring, at our last meeting, to M. Edmond André's recent Mémoire on the Genus *Chalcis* of Fabricius, I abstained from entering into certain intricate details respecting the caudiform appendages of the females, whose anomalous characters were elaborately discussed by the late Dr. Sichel in his 'Monographie des genres *Phasganophora*, Westwood, et *Conura*, Spinola,' in the Annales of the French Entomological Society for 1865 (4e série, tome v., p. 345; pl. 9, figs. 4 and 5, a—g; pl. 10, fig. 1, a, b, g).

This distinguished writer points out that "Le genre *Phasganophora* est principalement caractérisé par une modification très-rémarquable et singulière de l'abdomen des femelles, ou, pour être plus précis, de la valvule anale inférieure (*hypopygium*). Celle-ci se prolonge beaucoup en arrière; concave à sa face inférieure, convexe et fermée à sa face supérieure, comprimée sur les côtés, elle enveloppe la tarière, qui ne reste découverte que dans une portion plus ou moins longue de son extrémité postérieure. Cette conformation particulière de l'hypopygium n'existe dans aucun autre genre d'Hyménoptères" (p. 350).

The terminal dorsal and ventral segments (epipygium and hypopygium) are thus conjoined; the latter, enveloping the terebra and its sheaths, being grasped firmly by the former towards its apex, as though constituting a continuous portion of the dorsum itself; thereby inducing an illusory persuasion that the epipygium must exist in proximity to the apical extremity of this caudal appendage (*cauda*, Sichel), rather than in an intermediate position as aforesaid. Dr. Sichel has shown that the true *epipygium* in the females is always next in succession to the 5th segment, although the divisional boundaries of the respective segments are sometimes so imperceptibly defined as to lead to erroneous conclusions of their numerical position in the series.\* It is the last

\* *Note*.—Dr. Sichel explains, by the insertion of an additional paragraph (p. 386), that in *Conura flavicans* and *scutellaris*, Spinola was deceived like himself; "parceque les limites des deux premiers segments étaient indistinctes et confondues dans nos deux exemplaires. Dans la figure de Spinola (Mag. de Zoologie, 1837,

dorsal segment, abutting on a narrow impunctate belt appertaining to the hypopygium, where their union is effected as aforesaid.

Each of these terminal segments, thus conjoined together in the *females*, is furnished with a pair of spiracles, seen in succession from above, and first recorded by Prof. Westwood in his figure and description of *Chalcis pyramidea*, Fab. (Trans. Ent. Soc. Lond. vol. ii. p. 224; pl. xx., fig. 6*a*); those of the epipygium (6th segment, Sichel) being rotundate, and located close to the base on each side; those of the hypopygium, elongate-oval, situated towards the projecting apex above, in proximity to the aforesaid impunctate belt, while separated *inter se* by a slightly carinated ridge. In the *males*, however, where the terminal segments retain their normal condition, the 7th dorsal segment (*epipygium*) is alone furnished with its usual spiracles, the hypopygium below having none.

M. André, however, does not seem to be fully persuaded of the peculiar conformation of these terminal segments in the female, or of the conjunction of this caudal appendage with the epipygium in succession thereto, when he denounces, as “une erreur commise involontairement par le docteur Sichel,” that, by some strange misconception of the text and figure of Prof. Westwood (*loc. cit.*), the former “semble reconnaître en effet la présence de stigmates à la base (?) de ce qu’il appelle l’hypopygium, qui est en réalité le 7e arceau ventral de l’abdomen” (p. 334). M. André contends that “Celui-ci considérant en effet, avec raison, que les parties que le docteur Sichel appelle *epipygium* et *hypopygium* constituent par leur ensemble un seul segment abdominal—le dernier visible, dit: ‘*Abdominis segmentis duobus apicalibus utrinque puncto spiraculiformi, ut in generibus Ibalia et Leucospide*’;” while—as our esteemed colleague conceives—“la figure explique surabondamment que ‘*segmentis duobus*’ s’applique à l’*epipygium* de Sichel et au segment dorsal qui le précède, mais nullement à son *hypopygium*. Celui-ci n’en présente, par le fait, aucune trace, ou du moins je n’ai pu en découvrir”!

pl. 180) les deux premiers segments sont représentés comme n’en formant qu’un seul; ce qui y paraît le cinquième segment est en réalité l’*epipygium*. Ce que j’ai regardé dans ces deux espèces comme l’*epipygium* est l’hypopygium.”

In the aforesaid figure, however, the two spiracle-bearing segments adverted to by Prof. Westwood are the 6th and 7th in the order of progression (and not the 5th and 6th); the former corresponding with the spiraculiferous "*épipygium de Sichel*," and the latter with his subjacent *hypopygium*, projecting beyond, and followed by the terebra and its demi-sheaths. Moreover, in all Dr. Sichel's described species (*loc. cit.*) the *first pair* of spiracles is invariably associated with the *sixth* or terminal dorsal segment in the females, and the *second pair* with that portion of the caudal process next in succession thereto; the structure of which is thus defined by Dr. Sichel (p. 355):—

"Cet organe est composé de trois parties :

"1. La *valvule anale supérieure* (*épipygium*, pl. 9, fig. 4, *a, b*; 5, *a, b*; pl. 10, fig. 1, *a, b*) est très-convexe et quelquefois un peu bossuée. Son bord postérieur est étroitement appliqué à la valvule anale inférieure, sans y être soudé, si ce n'est exceptionnellement. Tout près de sa base, elle porte de chaque côté un stigmate (spiracle) arrondi. M. Westwood (*loc. cit.*) a été le premier à indiquer l'existence de ce stigmate et de celui du bout de l'*hypopygium*.

"2. La *valvule anale inférieure* (*hypopygium*), convexe en haut, concave et creusée à sa face inférieure, très-comprimée en forme de gaine, remonte des deux côtés de la tarière en se recourbant au dessus d'elle, de manière à l'envelopper en entier et la cacher dans une très grande étendue, dans plusieurs espèces presque jusqu'à son extrémité postérieure. Tout près de son apex, l'*hypopygium* (ou fourreau de la tarière et de sa gaine) porte de chaque côté un stigmate ovalaire. A sa face inférieure, ses bords libres se joignent et s'appliquent si étroitement l'un à l'autre, que cette face paraît fermée à peu près dans l'étendue de l'*épipygium*, puis, à partir du bord postérieur de celui-ci, à peine fendue par une étroite rainure linéaire jusqu'à son extrémité postérieure.

"3. La *tarière* (*terebra, oviscaptus*), composée de ses gaines ou valves, comprimée et, selon les espèces, droite ou un peu recourbée à son extrémité postérieure. Entre les valves se trouve logée la tarière elle-même."

It should, however, be observed that M. André entertains certain divergent views as to the *7th dorsal* and *ventral segments* respectively, whereby these are considered to represent what he terms the "*épipygium* et



*hypopygium* de Sichel," as enunciated from time to time. Thus, in the passage already referred to, where he first speaks of the "*hypopygium* qui est en réalité le 7<sup>e</sup> arceau ventral de l'abdomen" (p. 334); and again, on the following page, when he adverts to the "7<sup>e</sup> segment abdominal" as corresponding with the "*épipygium* et *hypopygium* de Sichel"; he shortly afterwards discusses the relative length of the "arceaux dorsal et ventral du 7<sup>e</sup> segment," in *Chalcis minuta*; and subsequently notices "la présence, dans les *Phasganophora*, d'une paire de stigmates sur le 7<sup>e</sup> arceau dorsal," which, he adds, "se retrouvent exactement avec les mêmes dispositions chez toutes les espèces de *Chalcis*" (p. 336).

In all these instances M. André is presumably speaking of the *females*, or of both sexes, in the former of which the 6th terminal dorsal segment represents this "*épipygium* de Sichel," the 7th having no existence at all; and the projecting apex of the hypopygium presenting only the *semblance* of an additional dorsal segment. In testifying, therefore, indiscriminately to the existence of these spiracles "sur le 7<sup>e</sup> arceau dorsal," M. André unconsciously avows the recognition of the *spiraculiferous apex* of this "*hypopygium* de Sichel," which he so strenuously repudiated before. On the other hand, it is mysteriously suggested in a footnote that "Les véritables *epipygium* et *hypopygium* sont les deux arceaux du 8<sup>e</sup> segment abdominal, invisible et tout à fait transformé chez les *Chalcidites*" (p. 334); thus recognising also that complicated transformation of these terminal segments which Dr. Sichel alone has endeavoured to elucidate.

Towards the close of his *Mémoire*, however, M. André has thrown a new light upon this subject in describing two species of *Smicra* (*S. picta* and *S. flavescens*), both females, the abdomen of the former having the "7<sup>e</sup> segment prolongé en forme de queue, son arceau ventral (*hypopygium* de Sichel) plus long que l'arceau dorsal" (p. 342). In the second species no mention is made of these terminal segments. Some clue is thus afforded to the signification attached to this suppositious "7<sup>e</sup> segment" by its component parts, as aforesaid the latter and shorter of which, in succession to the 6th segment, being obviously the *apical portion* of the *true hypopygium* (Sichel); while the former, *plus long*, can be no other than the *terminal portion* of the *projecting cerebral*

*sheaths*, which have been here apparently confounded with the "*hypopygium* de Sichel," as the supposed "*arceau ventral*" where all search for *spiracles* had proved unavailing; the spiraculiferous apex of the *true hypopygium* (Sichel) being thus ascribed to the *epipygium*, or supposed "*arceau dorsal*" of a non-existent "*7e segment*," and the *true epipygium* (Sichel) being regarded as the "*segment dorsal qui le précède*."

Walker, in his 'Notes on Chalcidæ,' says that "*Phasganophora* and *Halticella* agree in general structure" (p. 40); and this is more especially witnessed in Dr. Sichel's subgenus *Allocera* (Ann. 1865, p. 379), founded on a single example from Algiers (*A. bicolor*, Sichel, ♀; = *Euchalcis Miegii*, Dufour, Ann. 1881, pl. 1, fig. 4), which exhibits all the generic characteristics of *H. osmicida*, though specifically distinct. Thus, in the latter, the dorsal segments of the abdomen are laterally prolonged into a series of overhanging flaps, which conceal the ventral region to a considerable extent. Speaking of these in *Allocera*, Dr. Sichel says, "Les arceaux ventraux sont si courts et couverts dans une si grande étendue par les arceaux dorsaux, qu'on les voit à peine" (p. 380). The contracted basal portion of this ventral region is depressed far below the rest in the guise of a carinated recess, open posteriorly, and not extending beyond the third dorsal segment; its sloping sides, of translucent flexible consistency, indicating, in the same species, four or five overlapping segmental divisions firmly welded together, the terminal segment of these being considerably longer than the others. In *Chalcis pyramidea*, Fab., five of these segments are shown (Westwood, *loc. cit.*); whereas in *C. Gallia*, Sichel, the whole of the ventral segments are described by Dr. Sichel as "*ferè in carinam compressa, rufa, tenuia, semipellucida, subconnata, ita ut ultima unicum tantum segmentum, ab hypopygio valde distans et vaginam amplam effingens, constituent*" (*loc. cit.*, p. 373). By the angular gap at the termination of the aforesaid carinated recess, free action is afforded to the terebra from within; this aperture being apparently closed at will by bringing the hypopygium more or less into contact with the salient angle below, as witnessed in some specimens, and doubtless also by the closer conjunction of the projecting dorsal flaps, described by Dr. Sichel (in his *Allocera* = *Halticella*) as "*omnium lateribus in ventrem decur-*

rentibus, ibique secundum lineam longitudinalem juxtapositis et circa hypopygii basin segmentaque ventralia brevia subnulla junctis" (*loc. cit.*, p. 380).

The general structure of the abdomen and its appendages in *Halticella osmicida* will be best explained by exhibiting the different sectional parts under various aspects. The importance of such illustrations had not escaped the notice of Dr. Sichel, who states—"J'ai essayé de disséquer toutes ces parties mais je n'y ai réussi que très-imparfaitement sur mes individus déséchés depuis longtemps et difficiles à ramollir et à manier" (p. 354).

In the figures which M. André has supplied of the terminal segments in several species, the corresponding parts whereof are not cited in the *females* (figs. 1*b*, 2*f*, 2*g*), the two spiraculiferous segments of his *Halticella venusta* ♀, represented in 2*f* and 2*g*, obviously coincide with the *epipygium* (Sichel) and *hypopygium* (Sichel) respectively,—the terebral sheaths projecting beyond the latter,—however difficult it may be to reconcile this with his remarks thereon. It must also be assumed that his figure 1*b* indicates the same relative parts in *Chalcis Gallica*, Sichel, ♀. As to his presumed *males* (3*c*, 4, and 5)—the sex being defined in the first only,—they have been credited in each instance with the full complement of *two pairs of spiracles*; and when speaking of these in *Phasganophora* and *Chalcis* M. André observes—"Les stigmates se retrouvent comme dans les femelles" (p. 336); although, in so far as hitherto recorded, the spiracles in this sex are limited to *one pair* on the terminal or 7th segment (*epipygium*);\* which I am now enabled to corroborate as regards the males of *H. osmicida*.

In the accompanying details of the latter, Plate xii., fig. 1 exhibits the dorsal segments of the abdomen in the female, removed in one connected series, terminating with the 6th (*epipygium*, Sichel), seen laterally. In fig. 2 the contracted ventral segments are retained within the overlapping range of the former; the apical portion, in this instance, having been detached from

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\* "*Epipygium minimum, compresso-convexum, basi utrinque spiraculo fere totum latus occupante notatum. Hypopygium itidem minutum, compresso-convexum, sed spiraculo carens. ♂ tres.*" (Sichel in *Phasganophora variegata*, *loc. cit.*, p. 380).

within the ventral recess. Fig. 3 gives the residuary portion of the ventral region in the foregoing; consisting of the *hypopygium* (Sichel) intimately associated with the *terebra* and its appendages, whose sheaths are here withdrawn from the former and separated, showing the *terebra* with its spiculæ in the intermediate space. Thus the *hypopygium* extends to the apex, in the absence of the usually projecting terebral sheaths; which, narrow at their origin and laterally compressed, gradually widen beyond their centre, changing colour from rufo-flavous to jet-black. At the basal extremity of the abdomen the subjacent terebral sheaths are reflexed back upon the dorsum, where the latter are dilated into two oval lateral circuits; beyond which, on the dorsal region, the *epipygium*, usually firmly attached to the impunctate transverse belt of the *hypopygium*, as if appertaining thereto, is here partially raised to exhibit the component parts of the latter; whose spiracles, on either side of its carinated apex, in other instances oval, are here circular, and closely follow the aforesaid belt, as in fig. 6.

The ventral region, reversed and seen laterally, is shown entire in fig. 4; the *terebra* reposing within the elongate channel of the *hypopygium* and its closed sheaths projecting to the extreme apex. The *epipygium* has also been retained *in situ* above. In fig. 5 the ventral region reversed is seen from behind, showing the basal recess; the *terebra* with its spiculæ being alone displayed, and its sheaths closed. The terminal portion of the same, seen from above, is shown in fig. 6, commencing with the impunctate transverse belt of the *hypopygium*, and terminating with the terebral sheaths. These sheaths, together with the *terebra* and its spiculæ fully displayed, are exhibited in fig. 7. The abdomen of the *male*, as seen from below, and the terminal segments of the same seen from above, are represented in figs. 8 and 9, and the corresponding segments of the female, as seen intact from above, are exhibited in fig. 10, commencing with the 5th; the last dorsal segment (*epipygium*, Sichel) being next in succession; closely followed by the impunctate belt of the terminal ventral segment (*hypopygium*, Sichel), and by the spiracles of the latter, separated *inter se* by the carinated ridge extending to its apex; the closed sheaths of the oviduct projecting beyond, with the extremity of

the terebra protruding between them. The hypopygium, and the terebra with its adjuncts are shown disengaged from each other in figs. 11 and 12. The apex of the former highly magnified (fig. 13) has been casually severed along the carinated ridge, where no suture exists; but being brittle and deflexed around the sheaths, when these are withdrawn from the longitudinal channel below it readily yields along this line, as here exhibited. The antenna of the female (with which that of the male closely corresponds, on a smaller scale) is shown in fig. 14; the fore and hind wings in figs. 15 and 16; and the posterior leg, in the same sex, with its incrassated internally serrate femur and minute tibial calcaria, in fig. 17; a similar structure, without the serrate margin, existing in the male.

With respect to the old genus *Chalcis*, our honoured colleague states that, after vainly seeking to discover some better definitions between this and *Phasganophora* than the unisexual character of the caudal appendages in the latter, he had unexpectedly been led to a conviction directly contrary to his expectations, compelling him to unite those genera together, as presenting intermediate transitions which rendered it difficult to determine the respective limits of each. Having come to this conclusion, he soon found that similar transitions among the species of the genus *Conura* irresistibly led to their absorption in like manner; some with *Chalcis*, and others, having a petiolated abdomen, being readily affiliated to the genus *Smicra* of Spinola; while the genus *Halticella* of Spinola, having the antennæ inserted near the mouth instead of at the vertex, served as a rallying point for others detached from *Phasganophora*. Thus, as M. André explains, “les trois genres *Chalcis*, *Smicra*, et *Halticella*, renferment chacun une série d'espèces à segments postérieurs de l'abdomen prolongés plus ou moins, quelquefois d'une façon démesurée, mais sans que l'on puisse les séparer d'une façon nette de toutes les autres” (p. 337).

No satisfactory result has thus been obtained by disregarding the characters of the terminal segments; and in fact, when limiting these subdivisions to *three*—whose prominent attributions are equally unstable, and involving therefore the same inherent defects—the arguments propounded as aforesaid must be no less available to debar these groups from any such privileged exemption.

On the other hand, the recognition of sectional distinctions and subsidiary alliances is of no mean value amid an extensive series of divergent types, which must otherwise entail inextricable confusion in the absence of such discriminating tests.

Dr. Sichel has remarked that, setting aside the peculiar conformation of their terminal segments, "les *Phasganophora* ressemblent aux autres *Chalcidoïdes*, et pourraient même être réparties comme sous-genres dans cette tribu, dont la plupart des genres auraient ainsi leurs représentants et leurs sous-genres correspondants dans toutes les coupes génériques de l'ancien genre *Chalcis*. Ainsi on pourrait entrevoir dès à présent qu'il existe des *Phasganophora* à antennes insérées au milieu du front et à pétiole allongé (*P. smicriiformes*)—ou court et presque nul (*P. chalcidiformes*)—et d'autres à antennes insérées près de labouche (*P. halticelliformes*)" (p. 350). But he could see no reason in this for abolishing those genera whose characters are founded on sexual distinctions; while—as he pathetically adds—"personne cependant n'a songé à les supprimer" (p. 351). He also elsewhere observes—"Toutefois il y a, comme toujours entre les genres voisins, certaines transitions qui pourront quelquefois rendre la distinction difficile quand le nombre des espèces sera devenu plus considérable" (p. 385); but it can hardly be alleged that the greater the number of species the less the need of sectional divisions, or that it will become the more expedient to amalgamate them all together on account of such presumable transitions!

Walker, in his 'Notes on Chalcidiæ,' when commenting on *Halticella* and its allies, observes that "the species are numerous, and there are many which agree with Dr. Sichel's definition of *Phasganophora*"; but he anticipates a very different result therefrom when he considers it "probable that in process of time the species of this family will be partitioned among an excessive number of new genera" (p. 40).

It must at any rate be obvious that, where habits are more or less identical, structural affinities afford the best test and true criterion of natural alliances, the guiding principle being to determine this result by means of such an index; and when, as in this instance, the pioneers of progress have recognised special distinctive characters, to abandon this vantage ground by retrograding

into the annals of the past, and by incorporating heterogeneous types with a host of others as in the infancy of scientific research, would be less befitting than to eliminate disturbing elements by affording a new status to any of the former which may stand in need thereof.

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EXPLANATION OF PLATE XII.

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DETAILS OF *HALTICELLA OSMICIDA*.

- FIG. 1. Dorsal segments of abdomen in female, entire.  
 2. Basal segments of dorsum reversed, showing the ventral segments within.  
 3. Hypopygium (Sichel) and ovipositor conjoined.  
 4. Ventral region, seen laterally.  
 5. Ditto, from behind; the terebra and spiculæ displayed.  
 6. Apex of preceding, seen from above ("Cauda," Sichel).  
 7. Terebra with sheaths and spiculæ displayed *in situ*.  
 8. Abdomen of male; ventral region.  
 9. Terminal segments of ditto, seen from above.  
 10. Ditto of female, seen from above.  
 11. Ovipositor, apart.  
 12. Hypopygium apart, seen from below.  
 13. Apex of hypopygium, highly magnified.  
 14. Antenna of female.  
 15. Fore wing of ditto.  
 16. Hind wing of ditto.  
 17. Posterior leg of ditto.

NOTE.—In the foregoing figures the various segments (1—10), and fig. 13, are magnified  $9\frac{1}{2}$  diameters; the remainder, 11, 12 and 14—17, 6 diameters.—G. S. S.